THE JOURNAL OF EDUCATIONAL SOCIOLOGY

THE HEART PROGRAM — ITS CHALLENGE TO EDUCATION

JAY B. NASH
MOREY R. FIELDS
ADOLPH R. BERGER
MARIAN F. HAUCK
Issue Editors

Foreword	*Morey R. Fields, Jay B. Nash and Marian F. Hauck*	433
Medical Aspects Of Heart Disease	*A. R. Berger*	435
Socio-Economic Aspects Of Heart Disease	*Bernhard J. Stern*	450
Rheumatic Fever	*Leo M. Taran*	462
Convalescent Care in Rheumatic Fever: Irvington House	*Harold C. Anderson*	468
A Program Of Total Care For Rheumatic and Cardiac Children	*Frances Bailen-Rose*	477
What the Classroom Teacher Should Know—And Do About Children With Heart Disease	*American Heart Association*	483
The Role Of The American Heart Association		490
Official Health Agency Programs For Heart Disease Control	*Thomas E. O'Brien*	493

APRIL 1951

THE JOURNAL OF EDUCATIONAL SOCIOLOGY

PUBLISHED BY

THE PAYNE EDUCATIONAL SOCIOLOGY FOUNDATION, INCORPORATED

157 WEST 13TH ST., NEW YORK 11, N.Y.

THE JOURNAL OF EDUCATIONAL SOCIOLOGY is published by The Payne Educational Sociology Foundation, Inc., monthly from September to May, inclusive. Publication and business office, 157 West 13th St., New York 11, N. Y. The subscription price is $3.00 per year; foreign rates, Canadian and South American, $3.25, all others, $3.40; the price of single copies is 35 cents each. Orders for less than half a year will be charged at the single-copy rate.

Entered as second-class matter September 27, 1934, at the Post Office at New York, N.Y., under the Act of March 3, 1879. Additional entry at the Post Office at Manchester, N. H., authorized January 16, 1950.

THE JOURNAL OF EDUCATIONAL SOCIOLOGY is indexed in *Educational Index, Public Affairs Information Service,* and *Business Education Index.*

PRINTED IN U.S.A.

THE JOURNAL OF
EDUCATIONAL SOCIOLOGY

A Magazine of Theory and Practice

Vol. 24 April 1951 No. 8

THE NEED TO ENLIGHTEN

A FOREWORD

Morey R. Fields

Jay B. Nash

Marian F. Hauck

Many unprecedented changes have taken place in this decade. Indication that some changes have been provocative is evidenced by the emergence of new patterns of thought and new areas of readjustment and investigation. Two premises are evident; one, the strength of the nation must be founded on the health of the children; two, educators must squarely face their responsibility in the development of the healthy individual.

The necessity for individuals to learn desirable ways of living in our complex society is supported by considerable evidence. The decline in the incidence of communicable diseases has been hailed as a milestone of public health success, yet, the marked increase in certain degenerative diseases has tinged the future with pessimism—for what is the good of living to old age if one can expect to experience cardiac or circulatory involvement?

The Heart Diseases—School and Community Problems, fourth in the series of Health Education Institutes sponsored by the School of Education, New York University

and held from August 15, 1950 to September 8, 1950, was designed to describe desirable living practices in a specific area.

It was suggested that certain selected papers presented at the Institute be included in the Journal of Educational Sociology. Thus evolved this issue.

While it was impossible to include all papers given, those were selected which met immediate educational needs and which had concepts that could be readily utilized in school programs. Additional papers were added to complete the subject presentations.

Authors assume full responsibility for their respective discussions and it should not be construed that New York University, the Journal of Educational Sociology or the issue editors endorse the stated points of view.

It is hoped that this issue will serve its purpose, — to enlighten.

Morey R. Fields is Associate Professor of Education, New York University.

Jay B. Nash is Professor of Education and Chairman, Department of Physical Education, Health, and Recreation, School of Education, New York University.

Marian F. Hauck was formerly with the New York Heart Association and is at present a part-time instructor at New York University.

MEDICAL ASPECTS OF HEART DISEASE

A. R. Berger

ANATOMIC AND PHYSIOLOGIC ORGANIZATION OF THE CIRCULATORY SYSTEM

For the optimal functioning of the body tissues and organs, their constituent cells must have a continuous and adequate blood flow which brings nutriment, removes waste products and subserves other essential functions. Cells vary greatly in their requirements from time to time and from tissue to tissue, and the necessary blood flow is supplied by the circulatory system. The system is so organized that an appropriate flow will be available to cells as they undergo a wide range of metabolic activity.

PHYSIOLOGIC ASPECTS OF THE SYSTEM AS A UNIT

The circulatory system is a vast network of tubes, the blood vessels, through which the fluid blood is kept in constant motion by a pump, the heart. The blood vessels vary to a large extent in their individual size and caliber, and in their physical and physiologic characteristics. If, at the same moment, all the blood vessels of the body were dilated or opened maximally, their total volume would far exceed the total volume of circulating blood, and an abnormal state of affairs would ensue. Under most circumstances, however, the size of this blood-vessel container and the volume of available circulating blood are kept equal by means of circulatory reflexes. Obviously, not all portions of the circulation will receive equal volumes of blood, and by carefully integrated reflex adjustments, relatively greater flow is directed to the more active organs and cells, at the expense of quiet tissues. An example of such a phenomenon is the shift in blood flow from muscles to the gastrointestinal tract following a heavy meal.

The arterial side of the circulation, leading blood away from the heart, consists of large arteries, small arteries, arterioles and, finally, capillaries. The arterioles are often likened to stopcocks, for they are the chief means for shunting large volumes of blood from one zone to another. The capillaries, minute vessels of the utmost physiologic importance, also serve as links to the venous system which returns blood to the heart.

Role of the Capillaries

The basic transactions whereby the circulation nourishes the tissues take place across the capillary membranes. These membranes, though fine and delicate, confine the blood cells (red, white and other) and the large blood protein and similar colloid molecules within the vessels, while allowing the water of the blood, with its dissolved materials and crystalloids, to pass freely from the capillaries into the tissue spaces. By the same token, tissue water and its dissolved substances readily pass back into the capillaries. The capillary level is the only one at which such an exchange of materials across vessel membranes can occur normally.

Certain requirements must be fulfilled to effect this exchange. In addition to a capillary membrane of proper resistance, or permeability, a force or pressure is necessary to drive fluid across that membrane. Another force is needed to bring back tissue fluid. The rate of blood flow through the capillaries must be slow but steady so that fluid exchange can proceed most efficiently. In the normal circulation these requirements are met.

Gradients of Pressure and Movements of Fluid

In general, fluids move under the influence of applied forces, from the region of the greater force, or higher pressure, to the region of the lower pressure. Such pressure gradients exist in the cardiovascular system. The prime source of this circulatory pressure is the heart. During its rhythmic activity the cardiac pump creates relatively great

surges of pressure within its chambers. These great variations of pressure, and accompanying quantities of blood, are ejected rapidly and violently into the arterial system for widespread distribution. As a consequence of the physical and physiologic properties of the various arterial vessels, there is a continuous transformation in the nature of the pressure and blood flows throughout the arterial system. Marked variations in pressure are smoothed out, and the speed of blood flow is reduced. By the time the blood and pressure reach the capillary level, a gentle and continuous, rather than a violent and intermittent, flow is attained.

Return of fluid into the capillaries is effected largely through the force exerted by the protein molecules normally present in blood. This force, termed the protein colloidal or osmotic pressure, is possible because the normal capillary membrane prevents the outward passage of proteins, and the protein molecules, thus restrained, exert a great pressure of attraction for tissue water. In rather simplified fashion, then, each capillary may be visualized as a loop from which fluid is pushed out at its arterial end by the arterial blood pressure, and into which fluid is returned at its venous end by the protein osmotic pressure.

Return of blood through the venous system to the heart is aided by forces resulting from the suction-like action of the chest's respiratory motions, the massaging action of the body musculature, and gravity.

ANATOMIC ASPECTS OF THE HEART

Myocardium, Pericardium, Endocardium, and Valves

The heart is a hollow organ, roughly the size of a small grapefruit or a closed fist and some 250-350 grams (8 to 12 ounces) in weight. The major portion of the organ consists of the myocardium, a special type of muscle tissue, the fibers of which are arranged in interlacing spiral and concentric bundles. The heart is situated in the center of the chest cavity immediately above the diaphragm and behind

the lower two-thirds of the sternum (breast bone). It is flanked and partially covered on either side by the lungs. The heart is conical in shape. The base, or broader end, projects toward the back and slightly to the right of the sternum. The narrow end, or apex, is directed downward and forward, and extends a little to the left of the sternum. The thrust of the apex is often felt normally when the hand is placed on the chest wall.

Enveloping the heart, and separating it from the other structures in the chest, is the pericardium. The pericardium's outer layer is tough and fibrous but lining this, and reflected onto the outside of the heart muscle, is a smooth membrane. Between this smooth double-fold of membrane is a small amount of fluid which moistens the contiguous surfaces and allows free motion of the beating heart.

The cavity of the heart is divided vertically by a muscle wall or septum into a right and left heart. Each heart is divided again into an upper chamber, the atrium, and a lower chamber, the ventricle.

The walls of the atria are distinctly thinner than those of the ventricles. This is related to their respective functions. The atria are primarily collecting chambers, whereas the ventricles are the pumping chambers. The thicker walls of the ventricles are responsible for almost all of the pumping action of the heart. In addition, the walls of the left ventricle are thicker than those of the right ventricle. The left ventricle does more work in pumping the blood through the longer systemic (body) circuit as compared to the right ventricle which propels the blood through the shorter pulmonary (lung) circuit.

The inner surface of the heart has a smooth lining, the endocardium. At certain sites, the endocardium is reinforced by supporting tissue and is fashioned into leaflets which constitute the valves of the heart. Each ventricle has two sets of valves, one at the entrance, the inlet valves, and the other at the exit, the outlet valves. The inlet set, situated

between the atria and ventricles, are called atrioventricular, and of these, the valve on the right side is the tricuspid, that on the left, the mitral. These valves allow blood flow only from atria to ventricles. Blood flowing in the reverse direction pushes the valves closed; excessive pushing or inversion is prevented by tendinous cords which anchor the leaflets. The outlet or semilunar valves are so designated because of their half-moon shape. The pulmonic valve on the right, and the aortic, on the left, close the exits to the pulmonary artery and aorta, respectively. The anatomic disposition of these valves is such that blood may flow freely from the ventricles, but should there be reversal of blood flow, the valve pockets fill, coapting the free edges of the leaflets, thus preventing regurgitation of blood into the ventricular chambers.

Special Cardiac Tissues and the Blood and Nerve Supplies to the Heart

The heart also contains highly specialized tissue for the initiation and transmission of its beat. One circumscribed mass of this tissue, located in the wall of the right atrium near the entrance of the large veins, is called the sino-atrial (SA) node. A second aggregate of this tissue, the atrioventricular (AV) node, is found in the lower portion of the interatrial septum, and from it, there extends a bundle of similar tissue (the AV bundle) which ultimately branches and ramifies extensively in the muscle of both ventricles.

The blood supply to cardiac tissues is derived from the coronary arteries, so named because of their crown-like arrangement around the heart as they leave the aorta. An abundant capillary network insures adequate flow to the myocardial fibers. The coronary venous blood drains into the right atrium. Under normal circumstances, the blood within its chambers contributes little, if anything, to the nutrition of the heart.

The heart is innervated by the autonomic nervous sys-

tem. In general, the nerves derived from the sympathetic component of this system, accelerate heart action or increase cardiac irritability, whereas the parasympathetic components, in general, have an opposite effect. Pain of cardiac origin is transmitted to the brain by way of the same sympathetic nerves.

PHYSIOLOGIC ASPECTS OF THE HEART

Rhythm of the Heart, Spread of the Cardiac Impulse and the Electrocardiogram

Muscle located anywhere in the heart has inherent irritability and rhythmicity, or the capacity to create an automatic rhythm. These qualities may be observed also in bits of muscle removed from the heart. The stimulus for the rate and rhythm of the heart beat normally is initiated at the sino-atrial node. (On occasion, the pacemaker for heart action may be located at some other site.) From its origin in the SA node, the stimulus passes relatively slowly across atrial muscle to the AV node and bundle. By virtue of the widespread ramifications of the bundle fibers, the stimulus is disseminated very rapidly and almost simultaneously throughout both ventricles, permitting a vigorous and coordinated contraction of all ventricular fibers.

Heart structures, when stimulated, undergo electric changes and currents are generated. These extremely small currents are conducted through the various tissues to the surface of the entire body, where they may be detected and recorded by suitable devices. An electrocardiograph, the physiologic and clinical adaptation of an ammeter, is such an instrument, and the photographed record which it inscribes is the electrocardiogram. Conventionally, the electrocardiogram is derived from the extremities and from the chest wall. The tracing so derived exhibits at least five distinct waves (labelled P, Q, R, S and T) or electric changes during each cardiac cycle. The P wave results from

atrial activation; Q, R, S, and T waves are correlated with ventricular phenomena.

The Cardiac Cycle

Upon appropriate excitation or stimulation, cardiac muscle — like any muscle — will contract. However, the contractile property of heart muscle — unlike other types of muscle — is such that very prolonged contraction is not possible, and relaxation follows promptly. The phase of contraction is systole; diastole is the phase of relaxation. As the heart performs its essential pumping functions, by virtue of this rhythmic systolic contraction and diastolic relaxation, there is a definite sequence of events and phenomena, the cardiac cycle. The cycles of the right and left sides of the heart occur practically simultaneously. On each side, atrial and ventricular activity is synchronized so that systole of the former precedes systole of the latter.

When the entire heart is in diastole (atria and ventricles relaxed), the semilunar valves are closed, the atrioventricular valves are open and blood returning to the heart flows passively from the veins through the atria into the ventricles. Immediately preceding the mechanical events of the ensuing cardiac cycle, the extremely minute electric currents associated with excitation may be detected by the electrocardiograph, as first the atria and then the ventricles are stimulated. With atrial systole, the passive flow of blood is aided by atrial contraction. A fraction of a second later, ventricular systole commences. At the first increase in intraventricular pressure, the atrioventricular valve leaflets are pushed together, and for a very short period, the ventricles — with both sets of their valves shut — are closed chambers. During this interval, the continuation of ventricular contraction on the relatively incompressible fluid blood produces such a marked rise in intraventricular pressure that it finally exceeds the pressure in the arterial system beyond the semilunar valves. At that critical instant

the pulmonic and aortic valves are forced open and for the brief remainder of ventricular systole, blood and pressure are ejected from the ventricular cavities into the arterial system.

During diastole of the ventricles the pressure within these chambers falls below that in the corresponding arterial systems and the semilunar valves are closed immediately to prevent any regurgitation. The same decline in pressure permits the atrioventricular valves to open and blood accumulated in the atria (which had been in their diastole during ventricular systole) flows into the ventricles once more, for a repetition of the entire cycle.

Vibrations produced by opening and closing valves, by contracting heart muscle, by flowing blood and by the impact of the entire heart against adjacent structures give rise to the heart sounds. At least two (the first and second) distinct sounds, and sometimes more, can be heard if the ear (or stethoscope) is applied to the chest wall. The various events — systolic and diastolic — of the cardiac cycle usually can be timed accurately by the correct identification of these sounds.

MEDICAL ASPECTS OF DISEASES OF THE CIRCULATORY SYSTEM

In a broad sense, disease manifests itself by giving rise to abnormal sensations or events. These sensations, purely subjective in nature, and perceived by the patient, are called symptoms. Disease also manifests its presence by alterations in the structure or function of tissues. Such alterations, termed signs, are objective.

Diagnosis — essential for rational treatment — is the determination of the characteristic nature of a disease. Diagnosis rests upon two broad bases: the acquisition of information about the patient and about his disease, and the evaluation and interpretation of that information.

The investigation appropriate to detect the objective

signs of disease is the physical examination of the patient. The symptoms, as well as any other pertinent information, must be elicited from the patient in the form of a complete story or history. Supplementary, and often critically important, information (such as the blood count, urinalysis or X-ray data) is obtained from the laboratory.

Since any structure or any portion of the far-flung circulatory system is susceptible, in varying degree, to disease, and since such morbid changes may simulate (or be simulated by) other diseases, a thorough study of the patient is indispensable for accurate diagnosis.

Cardiac Reserve

The adaptability of the heart to satisfy the needs of tissues and organs under diverse conditions leads to the essential concept of cardiac reserve. Cardiac reserve is a measure of the potentiality of the heart to increase its work over and above the work needed under resting or basal conditions. Though the demands sometimes made upon a heart may be excessive, and therefore not filled completely, a normal heart ordinarily is competent under most conditions of daily existence.

When a heart is diseased, its reserve capacity may become reduced. It must be emphasized, however, that not every damaged heart necessarily has a reduced reserve power. Adjustments, among which are enlargement (or hypertrophy), are effected so that a heart may compensate for its damage, and, in fact, the clinical terms "compensation" or "well compensated" indicate that the diseased heart is capable of normal (or practically normal) function.

The reduction in reserve often is so slight that it can be demonstrated only by an unusual stress. Sometimes the simple effort of walking or stair-climbing will make evident a diminished reserve. A heart which has lost all of its reserve is unable to perform its functions properly even when the patient is under basal conditions, at complete bed rest.

The terms "decompensation" or "decompensated" designate this state of cardiac inadequacy or failure. Breathlessness, cough, easy fatiguability, loss of appetite, and flatulence, and abnormal retention of water, with swelling of the ankles, are but a few of the manifestations which result from such failure of the heart to supply proper blood flow to the lungs, muscles, liver and intestinal tract or the subcutaneous tissues of the body. If the inadequate blood flow involves primarily the coronary arterial system, the myocardium is affected and the outstanding symptom is chest pain. True cardiac pain is experienced most typically beneath the sternum, often with extension to the left shoulder and arm. Angina pectoris is an expression of insufficiency of coronary blood flow and is characterized by this type of pain, which is brief in duration, provoked by exertion or excitement and relieved by rest.

The level of cardiac reserve is not fixed. Like money in the bank (with which it often has been compared), it can fluctuate widely, depending upon the nature and the course of the patient's disease, the effect of treatment and other factors.

Etiology of Heart Disease

Heart disease has a wide origin. Anything which is competent of causing such disease is called an "etiologic factor" (from etiology, the study of the causes of disease). The mere presence of an etiologic factor, however, does not mean that heart disease is present or, of necessity, must be produced. Furthermore, changes in the heart tissues may be temporary or reversible; with the removal of the etiologic factor, the heart changes can disappear. Only careful observation of the patient over a sufficient period of time will yield the answer to this problem. During such an interval, the term "potential" is used to indicate the existence, either past or present, of an etiologic factor, without the demonstrable co-existence of structural heart disease.

The congenital type of heart disease, in which an aberration in the development of the heart leads to its malformation, is present at birth. Most often, however, heart disease is acquired after birth. Rheumatic fever, hypertension, arteriosclerosis, syphilis and certain other infections are the commonest etiologic factors.

Pathology of Heart Disease

A diseased heart, in almost every instance, has some alteration in its anatomic pattern. Depending upon the responsible cause, this alteration may involve, singly or in any combination, any of the structures of the heart: pericardium, myocardium, endocardium and valves, the blood vessels of the heart (especially the coronary arteries) and the aorta and pulmonary artery. The most important of these changes (which are detected by physical examination and laboratory investigation) are deformities of the valves, enlargement of the heart chambers, sclerosis (hardening) and occlusion of the coronary arteries, and scar-formation in the myocardium.

Valvular Defects and Murmurs

By producing stenosis or insufficiency of a valve, inflammation and scarring affect valvular function. In the first-named state, the thickened leaflets fail to open completely or otherwise obstruct the free flow of blood. In the other condition, the leaflets fail to close completely and reflux of blood and pressure occurs. Any, or all, of the valves may be either stenotic or insufficient; both defects may be present simultaneously in the same valve. Valvular deformity affects the dynamics of the circulation. Also, by serving as a nidus for the bacteria which on many occasions enter the bloodstream, it enhances the occurrence of bacterial infection of the heart.

Blood flowing through a defective valve creates extra sounds (called murmurs) which may be heard upon auscultation of the heart. Depending upon the valve which is

affected and the nature of the defect, murmurs will occur during systole or diastole. Diastolic murmurs always signify heart disease. It cannot be emphasized too strongly, however, that systolic murmurs may exist in the complete absence of valvular defects and that systolic murmurs do not always imply heart disease. The significance of any murmur must be assessed with regard to the entire picture presented by the patient. The so-called functional murmur may arise from a variety of causes, none of which is due to intrinsic heart disease.

Size, Configuration and Radiography of the Heart

Changes in the size or configuration of the heart are important signs of cardiac disease. Abnormal physical stress within the circulatory system — usually the result of prolonged elevation of the arterial blood pressure, or of permanent valvular defects — is responsible for enlargement (hypertrophy) of the cardiac muscle fibers. The heart weight is increased and the cardiovascular silhouette is altered. The form of this change in the silhouette depends upon the location of the abnormal stress.

Radiography is the method of choice for the recognition of these changes. The conventional X-ray film of the chest delineates the cardiac silhouette in the frontal plane. This is a permanent but "still" film. Use of the fluoroscope permits the examiner to rotate the patient so that almost every surface of the heart can be seen. In addition, the pulsations of the heart chambers and great vessels can be evaluated.

The chambers of the heart, and other vascular structures, can be outlined by the injection of a radio-opaque dye (diodrast) into a superficial vein. As the diodrast passes through the heart, alterations (including abnormal communications between chambers) may be visualized on serial X-ray films. This method is angiocardiography.

Other radiographic methods, of some value but less often used, are roentgenkymography (a combination of fluoros-

copy and conventional films) and electrokymography (a combination of fluoroscopy and electrocardiography).

Myocardial Scars, Arrhythmia, and the Electrocardiogram

Scarring of the myocardium results from a variety of causes. Most commonly, it is the consequence of arteriosclerotic coronary artery disease. The abrupt closure (usually by clot formation or thrombosis) of a coronary artery has a characteristic clinical picture, including chest pain and collapse. The myocardium, deprived of its blood supply, undergoes acute necrosis (destruction) which, in a high percentage of cases, is reflected in the electrocardiogram. Electrocardiograms taken over a period of time reveal the typical features of heart muscle damage and recovery. On occasion, an abnormal electrocardiogram is obtained from a person in whom the heart attack had been "silent", i. e., not associated with overt symptoms. At all times, though, the electrocardiogram, like the systolic murmur, must be evaluated on its relation to the whole clinical picture.

The electrocardiogram serves also to identify the cardiac rhythm. During the course of heart disease (and, indeed, sometimes in persons with normal hearts) there may be disturbances in the heart action. The heart rate may exceed (tachycardia) or may be less than (bradycardia) the normal 60-100 beats per minute. At any rate of the heart, its regular action may be replaced on occasion by an irregular or erratic rhythm. The premature contraction (or extrasystole) is one of the commonest causes for arrhythmia. The premature contraction produces "skipping" of the heart and "intermittency" of the pulse. It results usually from the spontaneous generation of an impulse anywhere in heart muscle; it is possible because of the inherent rhythmicity of that muscle. Another common arrhythmia is auricular fibrillation, in which a chaotic auricular rhythm is accompanied by a fast and very irregular ventricular rhythm. Defective conduction of the normal impulse

through the heart, producing various types of heart block, usually can only be recognized by means of an electrocardiogram.

Cardiac Catheterization

A diagnostic method of recent origin is cardiac catheterization. Under local anesthesia and proper aseptic technique, a long thin tube is inserted into an arm vein and, using fluoroscopic vision, the tube is guided gently into the heart. The pressures within the heart are measured and blood samples are removed. The results of such studies shed much light on cardiac function and are of great value in the evaluation of a patient prior to surgery upon the heart or great vessels.

Many other technical procedures are available and are used in selected instances. In the last analysis, however, nothing can replace thoroughness, gentleness, and careful thought in the management of the patient with heart disease.

The Cardiac Diagnosis

By general agreement, the criteria and nomenclature suggested by the New York Heart Association are used for cardiac diagnoses. A complete cardiac diagnosis includes these headings:

1. Etiology—what has caused the heart disease.
2. Pathology—what structural changes have been produced in the heart tissues.
3. Physiology—what, if any, changes are there in heart action.
4. Functional and therapeutic.

The functional diagnosis is really an expression of the degree of cardiac reserve. It is a measure of the limitation which has been placed on the patient by the disease. It is signified by figures from I (no incapacity) to IV (cardiac insufficiency at bed rest). The therapeutic classification is

an index of the restriction placed on the patient by his medical adviser, such restriction being determined by a thorough evaluation of the patient and the disease, and indicated by letters from A (no limitation) to E (patient maintained at complete bed rest).

Though crucial gaps still exist. the sum total of knowledge concerning the circulatory system and its diseases is ever-increasing. Progress in the basic sciences allied to medicine, as well as in medicine itself, offer promise that the main riddle of heart disease (such as the causes of rheumatic fever, of hypertension and of arteriosclerosis) will be solved. Much can be done, meanwhile, to combat heart disease. Means exist for the cure or amelioration of many of the disturbances. The problem of heart disease, however, extends far beyond the heart. General public understanding, as well as scientific research, is required. The nature and magnitude of that problem must be presented. People should know the basic facts; incorrect ideas must be dispelled. A symposium of this type serves a most useful function by presenting the essential facts and by indicating the coordinated services which are available now for the management of cardiac disease.

A. R. Berger, M. D. is Assistant Professor of Clinical Medicine, New York University, College of Medicine and Chairman of the School Committee, New York Heart Association.

SOCIO-ECONOMIC ASPECTS OF HEART DISEASE

Bernhard J. Stern

The noted physician, William Osler, once said "Tuberculosis is a social disease with medical aspects". When this thought became a working principle of tuberculosis societies, they began their most satisfying work. Similarly, the range and importance of the field of nutrition widened decisively when Goldberger and his collaborators showed the relation of pellagra and other deficiency diseases to socio-economic conditions. I believe that the time is ripe for a comparable underscoring of the importance of the socio-economic factors in the field of degenerative diseases, particularly cardiovascular disease.

Medical educators are recognizing increasingly that medicine is a social science as well as a biological science. Yet, it cannot be said that this idea has percolated more than faintly into the curriculum of the schools and into medical practice. The successes of medical science in the control of external agents in communicable disease have tended to detract attention from the study of the patient as a whole and, at the same time, from the prodigious social changes which have been taking place that have affected the living and working conditions and consequently the health of the populace.

The development of clinical medicine and pathology with its emphasis on checking symptoms against lesions focused attention on specific organs and militated against an approach to patients as members of families and of society. The importance of taking cognizance of the patient as a human being in a specific cultural setting has also been in danger of being neglected because of the formality in physician-patient relationships arising out of urbanization and medical specialization. The treatment of patients under hospital conditions tends to negate the importance of the effect of

home and working conditions on the health of the patient who becomes an organism abstracted from his social environment. It is thus one of the incongruities of modern medicine that while developments in the field of deficiency and degenerative disease and particularly in psychiatry and psychosomatic medicine have impelled consideration of patients in the context of their life histories and socio-economic and cultural environments, many specialists persist in ignoring as irrelevant anything but the particular matter under scrutiny and treatment.

In dealing with cardiovascular diseases, it is especially important to bear in mind that human development takes place in the course of human activity and so is depentent upon the concrete historical conditions of human life, i.e. the material and social relations in which human beings mature. This is more than saying that an individual with certain hereditary characteristics is affected by conditions of his environment. The person and his social environment are in fact indivisible. The individual does not end with his skin, but his existence and his development are part of a process of continuous, active relationship with his social and cultural situation. In this sense persons, sick or well, are not merely organisms fulfilling their life cycles. They are also socially defined by the role given them by the society in which they are participants, by the work they do, by the sanctions and restraints by which each society regulates their conduct. Sex for example, is something more than differences in anatomy and hormones; it is socially defined by cultural dictates of anticipated and enforced behavior along sex lines, by sex division of labor and differential sex etiquette which vary widely in different communities. Likewise differences in skin pigmentation, head form, facial features, and stature become important when, because of such differences, persons and groups are discriminated against or priviledged in job and cultural opportunities, and their full physical and emotional devel-

opment are thwarted or take place under special conditions. Thus sociological factors must be taken into consideration in the interpretation of differences in rates of cordiovascular diseases by sex, and race. These differences cannot be considered exclusively, or perhaps even primarily in organic terms.

MORTALITY AND MORBIDITY STATISTICS

Mortality and morbidity statistics substantiate the importance of socio-economic environment in cardiovascular diseases. There are variations in accuracy of diagnosis and reporting; difficulties in isolating statistically the many factors involved in the etiology of cardiovascular diseases; and hazards in collating data originally collected and compiled for different purposes. Moreover changes in terminology over time complicate the analysis of the findings. Yet, in spite of these difficulties substantial statistical evidence is available which is sufficient to corroborate the thesis that socio-economic factors play a significant role in cardiovascular diseases.

Let us first consider general mortality and morbidity studies, a large number of which directly or indirectly demonstrate the relationship between the socio-economic environments and diseases designated statisically as chronic, degenerative, cardiovascular-renal and circulatory. They reveal differential rates by income levels, by social status, by extent of urbanization, by degrees of industrialization and by racial groups.

ROLE OF ECONOMIC FACTORS

The role of economic factors, as measured by differences in income is shown in a nation-wide study of the relationship between per capita income and mortality in ninety-two cities of 100,000 or more popluation.[1] The cities were

[1] M. E. Altenderfer. "Relationship Between Per Capita Income and Mortality in Cities of 100,000 or More Population" *Public Health Reports, 62*: 1681-1691, 1947.

arranged into three approximately equal groups on the basis of per capita buying power. It was found that in the case of the chronic diseases, which included intra-cranial lesions of vascular origin, all forms of heart disease, diseases of the coronary arteries and nephritis, the age-adjusted death rate per 100,000 population in 1939 and 1940 for the lowest income group was 514.9, for the middle group, 487.0 and the highest income group 479.7. The mortality rates of these diseases thus decrease consistently from the lowest to the highest income groups with an especially significant difference between the mortality rates of the lowest and middle income groups.

These findings are substantiated by morbidity data derived from the Health Survey[1a], which was conducted by the U. S. Public Health Service in 1935-36 and based upon a house-to-house canvass of some 800,000 families including 2,800,-000 persons in eighty-four cities and twenty-three rural areas in nineteen states. When the data are classified under the category of degenerative diseases the generalization that income affects disability emerges clearly. The annual per capita days of disability per person per year is, for the age group under twenty-five years, almost three times as high in families on relief, and twice as high for families with incomes under $1000, as for families with incomes $5,000, or over, and for the ages twenty-six to sixty-four years, it is over three and one-half times as high for families on relief, and over twice as high for families with incomes under $1,000 as for families over $5,000.

Local mortality studies in New Haven[2], Chicago[3], New

[1a] *National Health Survey*, 1935-36. Disability from Specific Causes in Relation to Economic Status. Preliminary Reports, Sickness and Medical Care Series, Bulletin No. 9., Washington, 1938.

[2] J. H. Sheps, Cecil and Watkins. "Mortality in the Socio-Economic Districts of New Haven", Yale Journal of Biology and Medicine, 20:51-80, 1947.

[3] L. C. Coombs. "Economic Differentials in Causes of Death", *Medical Care*, 1:246-255, 1941.

York[4], and Boston[5] corroborate the conclusions of the national studies. In England and Wales, the statistics of the Registrar-General show a steep rise in mortality for valvular heart disase and chronic endocarditis with a decline in social status associated with occupational differences. not only for men[6] but for their wives[7].

URBAN-RURAL DIFFERENCES IN THE UNITED STATES

Recorded mortality for diseases of the heart in the United States in 1940 declined as the size of city decreases, with clearly marked urban-rural differences. The extent of industrialization and related factors such as income and availability of medical facilities and services are correlated with heart disease when the size of the city is held constant[8]. In the case of the major component, disease of the myocardium, the rural rate was only about two-thirds that of urban parts of the United States[9]. Deaths from diseases of the coronary arteries and from acute endocaritis showed similar differences betwee urban and rural rates. Both urban and rural mortality recorded for all diseases of the heart in 1940 was slightly higher in the North than in the South and Eastern than Central sections of the United States. The broad regional distribution of industrialization, as measured by the percentage employed in manufacture,

---

[4] Study of Health Needs — New York City under the Joint Auspices of the Health Council of Greater New York and the New York Academy of Medicine (Manuscript).

[5] I. V. Hiscock and Hugh R. Leavell. "Survey of the Social and Health Needs and Services of Greater Boston" Boston, 1949, p. 18 (Mimeographed).

[6] Registrar-General's Decennial Supplement, Part II. Occupational Mortality, Fertility and Infant Mortality England and Wales, London. These reports have been analyzed by Morris, J. N. and Titmus, R. M., "Epidemiology of Juvenile Rheumatism", Lancet 2:59-63, 1942.

[7] Metropolitan Life Insurance Company, Studies in Heart Disease, New York, 1946, p. 7.

[8] Mary Grover. "Mortality from Heart Disease (all forms) Related to Geographic Section and Size of City", *Public Health Reports* 64:439-456, 1949.

[9] Mary Gover and M. Y. Pennell. "Mortality from Eight Specific Forms of Heart Disease Among White Persons", *Public Health Reports*, 65:824, 1950.

generally corresponds to that of mortality from heart disease[10].

Mott and Roemer, who also compared the crude and age-adjusted death rate of rural communities with those of towns and cities concluded: "While the problem of heart disease is complex, and must be considered in relation to its different causes, it seems fair to assume that this differential is due mainly to the oft-described stresses and strains of urban life and occupations. Whatever may be the actual pathogenesis of arteriosclerotic or hypertensive heart disease, the most common types found, there is much evidence to point to a relationship with the nervous strains more typically a part of urban than of rural life."[11]

SEX DIFFERENTIALS

Sex differentials in mortality from heart disease in 1940 strongly suggest socio-economic determinants. Seven of the eight specific forms of heart disease showed a higher mortality for men of all ages than for women, the exception being acute rheumatic fever where the rate was almost the same.[12] The greatest sex differential was the case of syphilitic heart disease with the male rate nearly four times that for females. Death rate from diseases of the coronary arteries among males exceeded those of the females by 141 percent. In urban areas the excess of male over female heart disease mortality was markedly higher than in rural with the exceptions of valvular heart disease and congenital heart disease.

RACE DIFFERENCES

The Census Bureau publication on "Vital Statistics Rates in the United States, 1900-1940" aptly declares, "An observed difference in mortality between races may in actu-

[10] Gover, Footnote 9.

[11] F. D. Mott and M. I. Roemer. Rural Health and Medical Care. New York, 1948. p. 58-60, 72.

[12] Gover and Pennell, ibid, p. 822.

ality be no more than a difference in mortality of different economic classes." This offers the clue to the understanding of the differential mortality rate for cardio-vascular-renal diseases among non-whites and whites. A comparison of the crude and age-adjusted death rates per 100,000 for non-whites and whites for 1919-21, 1929-31, and 1939-41 for diseases of the heart, intracranial lesions of vascular origin and nephritis, shows that adjusted rates are consistently to the disadvantage of the non-white.[13]

Similar results are brought out by a comparative analysis of the mortality rates among industrial policyholders of the Metropolitan Life Insurance Company[14] for the years 1911-15 and 1940-44 which showed that the death rates for cardio-vascular-renal diseases were consistently higher for all ages and at both periods for the colored males and the females as compared to whites. The death rate for colored males in the 45-54 age category, was in 1940-44, 747.9 per 100,000 as compared to 573.8 for the white, higher than the white rate was in 1911-15 (713.8). Similarly in the 55-64 age group the rate was 1801.5 per 100,000 for the colored males as compared to 1449.3 for the white males, also higher than the rate of the white group in 1911-15 (1782.14).

Further evidence of differential rates for Negroes and whites is shown by the fact that the incidence of defects from cardiovascular diseases among the first two million selectees in World War II, ranging in age from 21 to 36 years was found to be 46 per 1000 for Negroes and 27 per 1000 for whites.[15]

The high incidence of hypertension in the Negro at an earlier age, may be ascribed to the tensions involved in their

---

[13] M. Gover. "Negro Mortality. III. Course of Mortality from Specific Causes", 1920-1944, *Public Health Reports* 63:201-213, 1948.

[14] Metropolitan Life Insurance Company, "Large Decline in Mortality from Degenerative Diseases", *Statistical Bulletin*, March 1946, p. 3.

[15] L. G. Rowntree, K. H. McGill, and C. H. Folk. "Health of Selective Service Registrants", Journal American Medical Association, 118: 1223-1227, 1942.

adjustment to an unfavorable invironment.[16] The high rate of syphilitic heart disease among Negroes, a sequel to the very high rate of syphilis, has been demonstrated statistically as being associated with the poverty of the Negro and with inadequate medical care.[17] Information on the comparative rates for coronary diseases among national groups in the United States is fragmentary and inconclusive.

RELATION TO OCCUPATION

There has long been considerable interest in the relation of coronary diseases to occupation. Physicians have generally followed the early judgment of Osler that coronary artery disease occurs more frequently among persons in the business and professional groups than among persons in other occupations. This observation, which has been based largely on clinical impressions, may perhaps be derived in part from the fact that cardiologists engaged in consultation practice, deal for the most part with patients among the well-to-do classes. Careful statistical studies are necessary before this judgment or the contrary judgment that the incidence is practically the same for all walks of life,[19] can be fully validated. Time does not permit a review of the conflicting conclusions of the published studies.

Answers to questions of the relation of occupation, social status or social class to coronary occlusion are closely asso-

[16] W. S. Hunter. "Coronary Occlusion in Negroes", Journal of the *American Medical Association*, 131:12-14, 1946.

M. M. Weiss and J. J. Pruskmack. "Essential Hypertension in the Negro", *American Journal Medical Science*, 195:510-516, 1938. L. I. Orenstein. "Hypertension in Young Negroes", *War Medicine*, 4:422-424, 1943.

M. Kesilman. "The Incidence of Essential Hypertension of White and Negro Males", *Medical Record*, 154:16-19, 1941. E. H. Schwab and V. E. Schulze. "Heart Disease in the American Negro in the South". *American Heart Journal* 7:710-717, 1932.

[17] L. J. Usilton and G. C. Ruhland. "Survey of Venereal Diseases in the District of Columbia", *Venereal Disease Information* 21:244-254, 1940. H. H. Hazen. "Syphilis in the Negro", U. S. Public Health Service, Venereal Disease Information Supplement, No. 15 Washington, 1942, p. 7.

[18] William Osler. "Lumleian Lectures on Angina Pectoris," *Lancet I:* 697-702, 839-844, 973-977, 1910.

[19] P. D. White. Heart Disease, New York, 1931, p. 414.

ciated with judgments on the role of effort. trauma and work in the onset and subsequent course of coronary artery occlusion. Whether or not coronary occlusion can be precipitated by physical exertion has been a matter of considerable medical debate.

The trend in medical judgment on this issue may be ascertained by the fact that in New York and New Jersey, persons who experience cardiac infarction while undergoing some unusual strain while at work are now allowed workmen's compensation benefits.

RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE

In the case of rheumatic fever and rheumatic heart disease the evidence clearly confirms the importance of socio-economic factors. Long before rheumatic fever was associated with streptococcal infections, it was observed that the prevalence of the disease was greater among poor people living within poverty-stricken sections of communities. Findings made in Kiel and Leipzig as early as 1885 have been frequently quoted, but for a long period especially between 1910 and 1925, there was a marked lack of interest in the socio-economic aspects of the disease. As in the case of other public health programs, attention was then focused narrowly on the processes of infection to the exclusion of the broader sociological factors.

In the 1920's, however, studies began to consider again the relationship between rheumatic fever and living conditions, particularly poverty in cities. These researches first undertaken in Great Britain sustained the general impression rheumatic fever and rheumatic heart disease were relatively rare among the well-to-do but frequent in working class populations. Their initial conclusion, however, that these diseases were more prevalent among the artisan class than among very poor workers, immediately provoked considerable controversy, and has since proved invalid. Whatever may have been the special circumstances which led to

this judgment supported in the United States by Wilson[20] on the basis of a limited study of a clinic population, recent statistical studies of Morris and Titmuss[21] in England do not confirm it.

In the United States the findings of Collins[22] based on the National Health Survey and the supplementary Communicable Disease Survey of 1936, also invalidate the artisan theory of the disease. They found that the incidence and prevalence of rheumatic fever for ages five to nineteen among the white canvassed population rose consistently as the economic status decreased, and with the exception of one income group, the same was true for heart disease. The rates were generally twice as high for persons on relief and, in the case of heart disease, were sometimes three and four times as high. The relative increase in the rates as income decreased, aside from the high relief rate, was slightly greater in new cases than in total prevalence.

Local studies in Cincinnati,[23] New Haven,[24] Denver[25] and Philadelphia,[26] bear out the association of poverty and rheumatic fever. The much quoted studies by Wilson, Schweitzer and Lubschez,[27] dealing with the familial epidemiology of rheumatic fever do not contravene the evidence of the

---

[20] M. G. Wilson. Rheumatic Fever, New York 1940.

[21] J. N. Morris, R. M. Titmuss. "Epidemiology of Juvenile Rheumatism", Lancet, 2:159-63, 1942.

[22] S. D. Collins. The Incidence of Rheumatic Fever as Recorded in General Morbidity Surveys of Families, Supplement No. 198 to the Public Health Reports, Washington, 1947, p. 39-41.

[23] A. G. Wedum and B. G. Wedum., "Rheumatic Fever in Cincinnati in Relation to Rentals, Crowding, Density of Population and Negroes". *American Journal Public Health,* 34:1065-1070, 1944.

[24] J. R. Paul, Rheumatic Fever in New Haven, Lancaster, Pa. 1941, p. 40.

[25] B. G. Wedum, A. G. Wedum and A. L. Beagler., "Prevalance of Rheumatic Heart Disease in Denver School Children", *American Journal of Public Health* 35:1271-1281, 1945.

[26] O. F. Hedley., "Rheumatic Heart Disease in Philadelphia Hospitals", *Public Health* Reports, 55:1599-1619, 1940.

[27] M. D. Wilson, M. D. Schweitzer and R. Lubsches. "The Familial Epidemiology of Rheumatic Fever, Genetic and Epidemiologic studies II Journal of Pediatrics, 22:581-611, 1943.

importance of environmental factors. Their data are limited to only 109 families in a clinic population excluding the well-to-do, and the range between the best and worst environments was too narrow for a difference to be demonstrable.

Many studies have been made associating rheumatic fever and rheumatic heart disease with urbanization, overcrowded housing and nutritional deficiency. More detailed studies have shown, however, that these are important not as specific factors but primarily because they are associated with poverty. The general effects of poverty upon rheumatic fever for example, is shown by the fluctuations in the mortality rate of the British working classes as they moved from unemployment to employment after 1930. Full employment and higher wages favorably affected the course of mortality in spite of the deterioration in the housing situation.[28]

The fact that throughout the United States in almost all geographic divisions and individual states and in all age groups, whenever the death rates are based on large enough population numbers, the non-white children show a higher mortality for rheumatic heart diseases than do the white children, gives further evidence that rheumatic fever and heart diseases are influenced by adverse conditions of the social environment. Unfavorable social-environment conditions arising from poverty, especially bad housing, lack of hospitalization, lack of public health education and hygiene abetted by the factor of discriminatory practices against Negroes, all contribute to spread the acute disease, to increase rheumatic complications and consequently to increase the death rates.

---

[28] J. N. Morris and R. M. Titmuss. "Health and Social Change: I. The Recent History of Rheumatic Heart Disease". The Medical Officer, 72:69-71, 77-79, 85-87, 1944 .

J. A. Glover, "War-Time Decline of Acute Rheumatism". Lancet 2:51-52, 1943.

A comparison[29] of mortality rates from rheumatic fever and chronic rheumatic heart disease during 1939-1940 for persons under twenty-five years of age in cities of 100,000 or over where diagnostic facilities are better, shows that in the North mortality from rheumatic fever among colored persons is about twice that among the white, (4.6 per 100,000 compared to 2.4 per 100,000), while in the South where mortality is lower, the death rate for colored persons is three times that among the white, (3.8 per 100,000 compared to 1.3 per 100,000). In the case of chronic rheumatic heart disease, in the North the death rate for the colored was 16.2 per 100,000 compared to 10.8 per 100,000 for the whites, while in the South the rates were 7.6 per 100,000 and 2.8 per 100,000 respectively.

Socio-economic influences also account for the extremely high death rates for white children from rheumatic fever and rheumatic heart afflictions in the Mountain States where the relative high proportion of the population is persons of Mexican origin for whom socio-economic conditions are less favorable than for the remainder of the population classified as white.[30] The high rate among new immigrant groups, such as the Puerto Ricans may be ascribed in large part to their under-privileged social and economic status. Comparative data on other national groups is very fragmentary and inconclusive.[31]

In summary, authorities have come to conclude that the basic factor to be considered in the genesis of rheumatic fever and rheumatic heart disease is poverty itself and only secondarily its many specific manifestations, phychological as well as physical. This position is cogently stated by Mor-

---

[29] S. D. Collins. The Incidence of Rheumatic Fever as Recorded in General Morbidity Surveys of Families, Supplement No. 198 to the Public Health Reports. Washington 1947, pp. 36, 37.

[30] George Wolff. "Childhood Mortality from Rheumatic Fever and Heart Diseases", Children's Bureau Publication 322, 1948, p. 2, 14, 17.

[31] They are reviewed by J. R. Paul, "The Epidemiology of Rheumatic Fever" Second Edition, New York 1943, p. 67-70.

ris and Titmuss[82]; "The upshot seems to be that the whole life of the underprivileged child is involved. 'The destruction of the poor is their poverty'. In social medicine such multiple non-specific causation is not unexpected." These data all point to one basic conclusion. Since cardio-vascular diseases are, to a large extent, community products, they are a community responsibility. It will require the resources of all community agencies to conquer them.

[82] J. N. Morris and R. M. Titmuss, "Epidemiology of Juvenile Rheumatism" Lancet 2:59-63, 1942.

Bernard J. Stern, Ph. D. is Lecturer in Sociology, Columbia University and Lecturer in Anthropology, New School for Social Research.

RHEUMATIC FEVER

Leo M. Taran

For many years attempts had been made to separate rheumatic fever as an entity from the conglomerate mass of diseases of joints, extremities and heart diseases. No clear cut interest in rheumatic fever, however, was displayed until the beginning of this century when interest in the general welfare of children began to be on the concern of the medical and allied professions. This interest continues and has gained momentum in recent years because of the nature, extent and serious character of this illness and its inevitable inroads upon the heart. However, at the mid-point of the century there are clear indications that the twentieth century will see complete clarification and eradication of rheumatic fever as a disease.

CAUSE

The precise cause of rheumatic fever remains unknown. Valiant and sincere attempts, made both in this country and abroad, to find a causative agent have thus far failed. The

present etiologic concept of rheumatic fever is somewhat as follows: A child is born susceptible to certain traumatic factors found in his environment. This "susceptible" child must "mature" to express his susceptibility to these factors. Much has been said about the hereditary characteristics of rheumatic fever. Although there is as yet no complete agreement upon this concept, there are clear indications that the susceptibility to rheumatic disease is inherited. For years it has been felt that the child born and brought up in the slums is a more likely candidate for rheumatic fever than the one from the Mayfair section. There is good indication that in general this may be true. Yet many a child born and bred in the best environment falls victim of this disease.

In the last few years the hemolytic streptococcus has been given priority in the list of causative agents for rheumatic fever. And there is good evidence to show that it may indeed be one of the factors responsible for the onset or recurrences of this disease. It cannot be said, however, to be the primary or the only cause of rheumatic fever. In the light of recent knowledge regarding the physiology of the endocrine system, it is felt in some quarters that a specific endocrine physiology may predispose a rheumatic patient to the effects of a traumatic agent which may be common in the average environment. This common traumatic agent may be physical, physiologic, psychologic or social. The hemolytic streptococcus may represent one of the environmental factors.

NATURE OF THE DISEASE

Attempts to describe rheumatic fever along the same pattern as other acute infections have not only failed to clarify the picture of this disease but have indeed delayed progress in diagnosis and management. It is clear now that a rheumatic child presents four separate stages of the disease.

The stage of preparation or the so-called latent phase is the period during which the child does not show any of the

classical manifestations of this disease but on close scrunity shows definite evidence of ill health. This is the period during which it is believed the child is becoming sensitized or is developing an allergic reaction to the factor or factors responsible for setting off the next stage of the disease known as the acute phase.

It is this latter phase that has been described under the heading of rheumatic fever in most texts on children's diseases. Here the child presents many of the manifestations of any acute illness and in addition has certain characteristics specifically associated with rheumatic disease, such as polyarthritis, carditis, chorea, etc. When this explosive or acute stage is over there follows a stage of the disease which is poorly understood and has been inadequately described in medical literature, i. e. the protracted stage.

The protracted stage of the disease may last years during which the patient shows few of the so-called rheumatic manifestations, but during which evidence of progressive heart disease becomes established. On close examination the patient shows none or few of the signs of acute infection; none or few of the signs of chronic disease; but always and definitely disturbance in cardiac function to a lesser or greater degree. This period of protracted rheumatic fever or protracted carditis is now considered the most damaging stage of the disease since it is so elusive and lacks an easily recognizable symptomatology.

If the child has managed to weather the protracted phase without developing severe cardiac disease, he enters what is known as the quiescent stage of the disease. There is some question in the minds of pathologists as to whether a patient with rheumatic fever ever becomes quiescent. Some feel that clear evidence of rheumatic active disease may be discovered histologically many decades following the acute phase of the disease. From the clinical standpoint, however, we cannot stigmatize the patient as having evidence of rheumatic activity during the phase of the disease when he

no longer shows the usual rheumatic manifestations or evidence of progressive cardiac disturbance.

SCOPE

The protean and bizarre character of rheumatic fever and its chronology brings in its train not only difficult medical problems but also many psychological problems. To prevent cardiac neurosis or rheumatic fever neurosis the patient must be treated as a total human being. His background and his attitudes as well as his adaptive reactions to the disease in general and to its methods of management must be clearly understood.

A disease of long duration also brings to the foreground many social problems. The patient is taken away from society for long periods of time and in many instance loses the continuity of social living so essential for well being. In addition, the society from which he was removed often refuses to accept him back into its fold because he has been stigmatized as having a chronic, irreversible illness and because it is felt that he may not be as efficient a member of society as others. To avoid these social maladjustments complete and profound social case work has to be carried out in many of these cases.

Since this is a disease of childhood, it poses a problem in education of no small dimensions. It has been pointed out that many of these children lose the continuity of education and are later handicapped to the extent where they are completely discouraged and give up the attempt of regaining what has been lost. Furthermore, it must be admitted that many of these will develop irreversible cardiac damage which will impose great limitations upon their physical abilities. These individuals must be trained in occupations which place a lesser burden upon the efficiency of the heart. Plans for such education must be made well in advance since the end result of this disease cannot be predicted in most instances.

EXTENT OF THE DISEASE

A good deal has been said in recent years about the decline in the mortaliy from rheumatic heart disease, and some feel that the morbidity from this disease has also decreased. There are no clear cut statistical studies to show that rheumatic fever is definitely disappearing from the family of diseases. There are some indications that the life cycle of the rheumatic patient has been measurably increased since more effective treatment is provided for most patients. It is generally admitted, however, that it still remains the gravest childhood problem. It is estimated variously that between one and two per cent of the childhood population suffer from this disease. Little reliance can be placed upon many of the statistical studies since the nature of rheumatic fever is somewhat changing; its classical manifestations are gradually disappearing and its diagnosis has become a more difficult problem.

TREATMENT

All attempts at preventing the onset of rheumatic fever have thus far failed. None of the methods proposed have been proven to be effective to the satisfaction of careful students in this field.

Much more is known about the treatment of the acute phase of rheumatic fever. One principle is agreed upon by all, namely, that as long as the patient has acute rheumatic fever he must be treated actively. Whether one chooses the hospital, the home of the patient, or the sanatorium for the environment under which treatment is carried out is not the crucial question. The facilities of a sanatorium when brought and executed in the hospital or in the home of the patient would be effective no less than the sanatorium itself. Whatever the medicinal form of therapy may be, the acute phase of rheumatic fever must be treated in an environment in which the patient is at complete physical and emotional rest; an environment in which all medical, psychologic and educational problems are expertly attended to.

There are no short cuts at present. The newer forms of endocrine therapy have not as yet proven to be effective in changing the course of the disease. The reaction of the patient toward the invasion of this disease may be dramatically changed by the use of cortisone and ACTH but it cannot be said that the patient makes complete peace with the illness when treated with the newer hormones. In our experience, rheumatic activity continues while the patient is under treatment and certainly reactivates as soon as therapy is interrupted or discontinued.

Many suggestions have been made dealing with the rehabilitation of the patient during the quiescent stage of the disease. In our experience, quiescent rheumatic patients need no treatment. The exception to the rule is the patient who has a markedly depleted cardiac reserve and is either potentially or actually decompensated. These, we believe, have active carditis and, therefore, must be treated as acute rheumatic patients.

RESULTS OF TREATMENT

The results obtained from various forms of management are most difficult to evaluate since there is no agreement upon the diagnostic criteria of rheumatic activity. The evaluation of the efficacy of therapeutic measures can be made only of the basis of measurement of the extent of cardiac damage which follows therapy. From this point of view, in our experience, prolonged institutional care of a specialized nature offers the most encouraging results.

One must be fully aware of the shortcomings of prolonged institutional care for children. A good deal can be said on both sides of this argument. On the other hand, rheumatic fever is a difficult medical problem and may produce irreversible cardiac damage of a serious nature. The facilities, personnel and environment under which this disease is treated must be carefully prepared. This can be most readily attained in a special institution.

CONCLUSION

The outlook for the rheumatic fever patient may be looked upon with great deal of optimism. More is known about the illness; diagnostic acumen is greater; there is a better understanding of emotional component of the disease process; there is a great awareness by the public for the need for management of this disease; and, last but not least, there is a gradual but definite increase in the general standard of living—all these factors contribute to the prediction that rheumatic fever in children is on the "way out".

Leo M. Taran, M. D. is Medical Director, Saint Francis Sanatorium for Cardiac Children, Roslyn, New York.

CONVALESCENT CARE IN RHEUMATIC FEVER: IRVINGTON HOUSE

Harold C. Anderson

Rheumatic fever is one of the most important of all the diseases of childhood and adolescence. The acute phase of the disease is generally short-lived, but often minor clinical or laboratory evidences of the infection remain for weeks, months, or, in exceptional cases, years. Convalescence may be said to begin when all or almost all of the signs of rheumatic activity have passed away, and it only ends when the child is restored to that degree of activity which is compatible with the degree of cardiac damage he has sustained. For some, this may be complete, unrestricted activity; for others this may mean virtual bed rest.

To emphasize the importance of this disease, one may quote a survey conducted recently by the Association for the Aid of Crippled Children in New York City. This group asked a large number of professors of pediatrics and practicing pediatricians this question: "Considering visible as

well as invisible handicaps in children, which diagnostic or ailment groups do you think have the greatest unmet needs at the present time?" The most frequent answer was rheumatic fever, which was given by 60% of those who responded. As steps to remedy this need, the group suggested a four-point program consisting of: (1) public and professional education, (2) additional facilities for hospital care, (3) more convalescent homes, and (4) research.

At Irvington House we are attempting to help meet all four of these needs. Through our affiliation with New York University-Bellevue Medical Center we are cooperating in the post-graduate medical education of physicians. We have opened within the year a hospital unit of 23 beds for the care of children in the acute stage of the disease. An active research program is being carried out into some of the fundamental problems of the disease. Convalescent care is historically the oldest function of Irvington House and since it is also our assigned topic we will dwell mostly upon this subject and mention the former three only when they are germane to the discussion.

While the primary function of Irvington House is a medical one, I should like to emphasize at the outset that we are fundamentally interested in taking care of the whole child and not just his heart alone. It is becoming increasingly more difficult to separate the psyche from the soma, and in some instances, the child's reaction to his disease may become more important than his disease.

The staff at Irvington House is necessarily large. Besides those concerned primarily with finance and maintenance, there is a director in overall charge of the physical plant and personnel, a program supervisor, dormitory leaders, an occupational therapist, craft teachers, and school teachers. Two social workers serve as liaison agents between the children and their homes in addition to many other functions. The medical staff consists of two physicians, a biochemist, a consulting psychiatrist, a consulting psychologist,

a dentist, and two consulting cardiologists, and the nursing and laboratory staffs. The detailed functions of these persons will be elaborated later.

The House is a non-profit institution whose general policy is formulated and whose maintenance is looked after by a Board of Directors. The medical and research programs are under the supervision of a Medical Board whose members are appointed by the Dean of the College of Medicine of New York University. Most of the children admitted are medically indigent and their care is partly paid for by the City of New York or the County Welfare Agency if they come from outside the City.

Children of either sex between the ages of 6 and 14 are eligible for admission to Irvington House. They are referred to us for care primarily from the pediatric wards and the pediatric cardiac clinics of the hospitals in New York City. A few are referred directly by their family physicians in New York City and a few children a year are usually admitted from the suburban communities. This year a number of children have been transferred to the convalescent program directly from our own Hospital unit. The application for care is usually sent in by the social service department of the referring agency to the social service department of Irvington House. After the application is approved by the medical department, it is turned back to one of our social service workers. She visits the child and his parents in the home; if the child is still in the hospital, she visits both places. She describes Irvington House to the child and his family, interprets the need for convalescent care to both and evaluates the child's capabilities for adjusting to the group living imposed by the institution. Should everything seem satisfactory, admission is arranged as soon as there is an available bed. Should she detect in the child or in the family, physical, emotional or behavior problems which would make this adjustment to group living difficult or impossible, further studies

are necessary. She may seek the advice of our psychiatrists of she may have to make extensive inquires of hospitals or other social agencies to which this child or family is known. We do not deny admission to children with minor problems, but to those who have problems with which our staff, large and diversified as it is, cannot adequately cope, we do refuse admission. We provide transportation via station wagon to and from a convenient point in midtown Manhattan.

Chidren are first admitted to our infirmary which is large, pleasant, and sunny. Here they are seen by the medical staff, their physical status determined by clinical and laboratory means, and their physical capabilities evaluated. Here they also make their first contacts with the adults who will be their constant supervisors—and, I hasten to add—companions for the period they are with us. From the infirmary they are transferred to dormitories according to their age and sex. These dormitories house from 16-24 children and are large pleasant rooms. Two of them have solaria on each side. Each child has his own living space with a bed, lamp, bedside cabinet, and cupboard space. In each dormitory there is also some space set aside as a combination living room-playroom.

As soon as is possible after the child is admitted an admission conference is held which is attended by the social workers, one of the physicians, the program supervisor and the leaders of the dormitory concerned. If the child is being transferred from our Hospital unit the head nurse also takes part. Here the social worker describes the background from which the child came, his parents, his home, his past educational experiences, and any other pertinent information. The doctor gives his opinion of the physical condition of the child and the amount of restriction of activity that he deems necessary.

It is very satisfactory to note the entire lack of racial and religious prejudice among the children. Colored and white, Catholic, Protestant, and Jew live, eat, and sleep

together with no friction. It is a fine lesson in interracial and interreligious living. The religious needs of the children are met by clergymen of the three faiths who hold religious training and religous services at the House.

The children in each dormitory are under the direct care of dormitory leaders. These leaders are adults who have had or who are securing advanced education and who have usually had experience or special preparation in the handling of children. These leaders, of which there are two or three to a dormitory, assume the parental functions for these youngsters, supervise recreation, and, in addition, have certain specialized duties imposed by the health requirements of these youngsters. Among these duties are the taking of temperatures and pulses in the morning and in the evening upon retiring. Also they weigh the children at regular intervals and report to the proper persons any changes which they notice in the physical or emotional status of the children. Household tasks for the children are purposely kept rather light, but they do in part substitute for those the child would be expected to perform in his home, they assist materially in running the institution, and they give to the children that sense of responsibility which they need.

The dormitory leaders are responsible to the program supervisor who, in close cooperation with the medical service plans the day's activities. Much of the value of the children's stay with us depends on this person for it is she who must within the limits imposed by the children's physical condition plan a program of education and recreation which will compensate these children for the loss of some physical activity. This problem is particularly acute in the summer when there is no school, for it is no mean job to keep one hundred children, most of whom feel fine, occupied, happy, and yet more or less restricted physically from 7:30 in the morning to 9:00 at night.

To accomplish this task we have a comprehensive program of arts and crafts in addition to physical activities, We are fortunate in having a large, well-equipped shop with

wood tools, leather and metal craft tools and a small kiln for ceramics. In the summer two craft teachers alternate in the shop. Here all the children have a chance for a creative outlet several hours a week. Under close, but restrained supervsion, they are allowed to build or create what they will. The interest the children manifest in this work is very satisfying, because it is now a form of physical and mental occupation which is not very taxing and may spark their interest in a craft which later will be useful to them as a means of earning a living. Part of the school house has been converted into a studio and is filled with easels and tables for finger painting, painting with brush, sketching, and clay modeling.

The regulation of physical activity of these children is one of our great problems. In general we try to provide as many acceptable substitutes as possible, but these children need definite outlets for their physical energy. Those children with no apparent heart disease or else heart disease which imposes little functional strain on their hearts and whose laboratory and clinical examinations show little evidence of disease activity are allowed unrestricted activity. Our unrestricted activity, however, is not unregulated activity. Their play is always supervised, the very strenuous competitive games are eliminated, and frequent rest periods intersperse the period of activity.

Children whose condition requires varying degrees of physical restriction pose a more difficult problem because often the same worker must handle the restricted and unrestricted groups simultaneously. To accomplish this many ingenious devices have been thought up. In playing baseball, for instance, the restricted child may bat the ball, but one of the unrestricted children does the base running. There are usually enough children in the field so that no one has to move very far or fast to field the ball.

We are fortunate in having at Irvington House a school which is part of the New York City public school system and is capable of offering instruction from the first thru

eighth grade. There are 6 classroom teachers, 2 bedside teachers, a shop teacher, and a teacher-in-charge. The first two classes composed of the youngest children go to school in the main building.

The other four classes are held in a school building about one city block removed from the main buliding. This building was the coach house for the old estate which was located on the property. It was remodeled into an extremely pleasant school building. This remodeling was financed by one of the numerous lay groups which work for the financial support of Irvington House. All the classes in our school are small, averaging about 16 children to a class. It is vital that these classes are kept small, for most of our children have missed a great deal of school time because of their disease. With small classes much individual attention can be given to the children, with the result that some of them have raised their achievement levels in certain subjects as much as 4 or 5 years in one year's time. When it is raining or snowing, our station wagon is called into play and it can transfer all the children from the House to the school in less than 10 minutes time. It seems to be a good idea to us to have the school somewhat removed from the House because it approximates a more normal living arrangement for the children. While the bedside teachers operate primarily in the hospital ward, children from the convalescent ward who are confined to the infirmary for more than a day or two receive instruction from them and do not then, as a result of their illness, lose valuable school time.

Children who have gross emotional problems are given more intensive care and study. Most of this is done by the social service workers. They interview the child and the adults with whom he is in closest contact. Many times a problem at home which the child has heard about, but of which we are ignorant is at the root of the difficulties and these can often be cleared up or at least interpreted by the social worker. If more study is needed, the psychologist and the psychiatrist can be called in. Occasionally changes

in behavior represent the first symptom of a recurrence of chorea, and this must always be borne in mind in rheumatic children, especially in those who have had chorea before.

So far I have said very little about the strictly medical aspects of a convalescent care program for rheumatic fever. I have done this purposely to emphasize those other aspects of convalescence which tend to be neglected and which we feel are important.

The proper medical functions in a rheumatic fever program are to handle as well as possible the present attack of rheumatic fever in an attempt to minimize cardiac damage and to prevent future attacks of the disease which tend to increase the damage. I have already mentioned proper occupational and recreational therapy as factors in the first. By our close observation of the children with temperature and pulse determinations, weekly throat cultures, frequent determinations of the sedimentation rate, and regular clinical examinations, we attempt to detect very early any adverse change in their physical conditions so that proper remedial measures can be taken. We attempt to carry out these procedures in as casual and matter-of fact way as possible. All the children have their throats cultured at the same time each week and when blood is drawn for laboratory tests a whole dormitory is usually tested at a time. This does not make the child feel he is being singled out for these tests and tends to minimize the concern he feels about his own illness.

In a disease such as rheumatic fever, one must always try for a proper balance between a healthy attitude of common sense care for one's health and an unhealthy attitude of extreme overconcern which can lead to cardiac neurosis. Too often these children have overheard ill-advised medical conversation from their doctors or from their parents. A cardiac neurosis can be every bit as incapacitating as a moderate amount of organic heart damage.

Most of the doctors working today in the field of rheumatic fever believe the disease to be a sequella of strepto-

coccal infection. If streptococcal diseases can be prevented, so can rheumatic fever. Our children are therefore semi-isolated, especially from other children who so often harbor streptococci in their noses and throats. Parents are allowed to visit once or twice a month, but their young brothers and sisters are not allowed to visit. As a result of this policy and of early and adequate treatment of infections when they do occur we have been able to keep our recurrence rate to a very low figure.

The length of stay for our children averages between six months and a year. If the time they are ready medically for discharge falls very near to the end of a school term we tend to keep the child until that term is over. While the child is with us the social workers can attempt to improve the physical and financial condition of his home. It is not good sense to take excellent care of a youngster for a year and then send him home to the same unheated, sixth floor, walk-up tenement. We have been able to arrange housing projects for a number of our families. As a result, they have adequately heated and lighted homes, on the first or second floors, at a rental they can afford to pay.

In conclusion I should like to say that I do not believe all children with rheumatic fever need convalescent home care. The proper place for a child during convalescence is in his home provided the home and family adequate. This means adequate heat, light, food, and preferably a room alone. The mother must be able to care for the child; she must be a nurse, recreation worker, occupational therapist, and teacher, in addition to being a mother. There must be adequate access to medical attention and there must be a home teacher. If these conditions are met, convalescence should go on smoothly. If they cannot be met, then I believe the child will profit most from care in a convalescent home, and it is to the care of these children that Irvington House and similar institutions are devoted.

Harold C. Anderson, M. D. is Physician-in-charge, Irvington House, Irvington on Hudson, New York.

A PROGRAM OF TOTAL CARE FOR RHEUMATIC AND CARDIAC CHILDREN

Frances Bailen - Rose

Before describing the Lower East Side Rheumatic Fever Project, it is desirable to consider the services required in a total care program for rheumatic and cardiac children.

Case Finding

To begin with it is necessary for the cases to be found and the diagnoses to be confirmed. This confirmation at the outset is of greatest importance in avoiding harm to the child. In order to verify or confirm this diagnosis, many agencies and services are involved, including voluntary and municipal hospital clinics, private consultation services and the consultation services of the Department of Health.

Care of Active Rheumatic Fever Cases

Proper supervision of active rheumatic fever cases should be assured. Some of these will be hospitalized in recognized hospitals and under good supervision. In contrast, others may be ill at home and under private physician care of variable quality. These latter should have the benefits of specialized home consultation services and the services of public health nursing agencies as well as social service of the kind which is available to those under clinic or hospital care.

Convalescent care should be provided for children in the active and subacute phases of rheumatic fever under private physician care. At this time, recreational and educational opportunities should be given and stressed. A sick child without diversion and one who worries about lagging behind his group will not be a contented one. Since this child may be ill for long periods of time and for repeated illnesses, continuity of education is most important in his adjustment to illness.

Care of Inactive Cases

In the inactive stage these same factors are important in a different way. The class placement and physical activity of the child have tremendous influence on his future development and adjustment to life. No child should be restricted longer or more than is necessary nor should he be kept in special classes longer than need be, thereby labelling him as different from the group. In order to accomplish proper placement, competent and experienced medical opinion is necessary. Services of the cardiac clinics of hospitals are available to render these opinions and for those under private physician care consultation services of a high calibre should be obtainable.

Vocational Guidance

Early in the life of a rheumatic or cardiac child, vocational guidance should be given. The life history of this disease is such that these chlidren should be prepared for occupations compatible with their future physical and mental abilities. This is not to paint too glomy a picture of the adult rheumatic but it is true that some of these rheumatic children will have limitations in adult and middle life. Each child should have a proper evaluation of his physical and mental capabilities at a time when vocational choice is still possible.

Recreational Opportunity

Recreational opportunity should not be denied children on the basis of their rheumatic or cardiac status. This is particularly important in camping. Often a rheumatic history alone will be enough to keep a child out of camp although many of these children are non-cardiacs and have had their rheumatic attacks years before. Under proper supervision these children could go to regular camps. For those whose activities need to be limited, a camp with properly trained personnel could arrange a program suitable for the individual child.

Social Service and Psychological Guidance

Social service and psychological guidance for children and their families is an important need. Help in improving home conditions both from an economic and social point of view should be given. Education of parents cannot be overstressed.

Community Aspect

If all these services are to be available a community or public health program with integration of all services is necessary.

LOWER EAST SIDE RHEUMATIC FEVER PROJECT

In order to implement a program of such service, a rheumatic fever project was begun in February 1947 under the auspices of New York University, New York Heart Association, New York City Department of Health, and the New York City Board of Education, for the study of administrative procedures for the detection, registration and follow-up of cases of rheumatic fever and heart disease in the Lower East Side. Because certain Health Department facilities, namely the School Health Service, the Public Health Nursing Service and the Cardiac Consultation Service already existed, initial efforts were placed on the establishment of a register and the procedures necessary to insure reporting cases, verification of diagnoses and follow-up of the cases known to the register.

About a year after the Project was started most of the procedures were working well, therefore emphasis was shifted from the development of administrative techniques to efforts in improving existent services and for making them available to children in need of such services. It was, in fact, the beginning of a development of a community rheumatic fever program.

The Rheumatic Fever Project is the central office to which all medical reports initiated either by the School Health Service or by the teachers of the Board of Educa-

tion taking care of the home-bound children are received. At the Project office a medical review of the report and the recommendations are made. Those in need of services are more fully investigated and effort made to secure these services for them. At this point, clarification of diagnoses is attempted by getting reports from hospitals and agencies involved and by telephoning private physicians to confirm histories. Consultation may be made. Physical activities as recommended by the physician may be discussed with him and proper interpretation of the School Health Service made. It may be necessary at this time to correlate the opinions and recommendations of clinics, physicians, and convalescent homes so as to avoid confusion in the school.

It was found that 60% to 65% of the children known to the Register were under care of approved medical agencies and that these children required less in the way of services from the project since the treatment agencies were able to provide social service, nursing care and convalescent care when needed. However, the Project interpreted some of the recommendations to the School Health Service for these agencies. Through the Register early reports for children returning to school from convalescent homes are requested and thus school placement is made easier.

It was further revealed that 35% to 40% were under private physician care. Since these children had not had as ready an access to community resources as those under hospital or clinic care either because the physicians were not aware of these resources or reluctant to use them, much emphasis was placed in this area. Convalescent homes were reluctant to accept these children either because of poor selection of cases or incomplete work-up. Realizing at the outset of the Project, that the cooperation of the private physicians in the community was of the utmost importance, a letter was written to them listing the following available services: 1) home consultation for children ill at home, 2)

public health nursing and medical social consultations, 3) nursing service through the Health Department Nursing Service or through the Visiting Nurse Service of New York, 4) assistance in obtaining hospital beds, 5) assistance in obtaining convalescent care. It was one of the basic objectives to educate these private physicians to take better care of these children and to avail themselves of the proper community agency services. A large percentage of private physician cases on the register has been seen at some time in the Cardiac Consultation Service. This has been largely due to the clarification of reports and to the assurance that the children will return to their physicians for follow-up.

As far as convalescent home placement is concerned, the Project served as a central referring agency arranging for a verification of diagnosis, of evaluation of need for care outside the home and the selection of an appropriate institution. The Bureau of Nursing and Visiting Nurse Service cooperated in filling out forms, seeing that laboratory work-up was completed and assisted with the special preparation of the patients and families for the separation of the child from the home.

Since the project is a demonstration and designed to point up the unmet needs as well as to use to the best advantage facilities available, it has been observed that some aspects of care are inadequate. Facilities for recreation and camping are among these. As a result of conferences with Children's Welfare Federation and the Project, a fact-finding survey was conducted last summer on camping. Arrangements were made for a large camping agency to undertake a special project with one of the affiliated clinics to provide camp care for a group of rheumatic and cardiac children on full activity.

In addition, there is need for better recreation facilities for home-bound children with active rheumatic fever or advanced heart disease under private physician care. Teach-

ers provided by the Board of Education spend a few hours a week with these children and a small voluntary agency exists providing some recreational facilites to home-bound children under care of some of the affiliated clinics.

The value of early vocational counselling for the rheumatic child has never been demonstrated. It is felt that such counselling would probably avoid the necessity of special job placements later in life and would decrease the task of rehabilitation.

In view of the acceptance of poor and congested living quarters as playing a part in streptococcal infection associated with the recurrence of rheumatic fever there is need for determining the situation in regard to priority of admitting special health problems to public housing projects. There is an increasing interest in health problems in the Housing Authority and it seems that in the future one may expect more progress in this respect.

By operating as a central referring agency the Project has been able to avoid duplications of services to rheumatic and cardiac children, a frequent occurrence in this group of patients. It has attempted to have facilities at hand used to their best advantage. It is clear that the unmet needs are those essentially of a community nature and education and planning by the community itself is essential to the carrying out of a total care program.

Frances Bailen — Rose, M. D. is Assistant Director and Consulting Cardiologist, Lower East Side Rheumatic Fever Project.

WHAT THE CLASSROOM TEACHER SHOULD KNOW — AND DO ABOUT CHILDREN WITH HEART DISEASE *

What many thousands of cases of rheumatic fever or rheumatic or congenital heart disease each year, the problem of the cardiac child in the classroom is one that the teacher must frequently face.

Teachers everywhere may be interested in the down-to-earth suggestions made by professional teams working on the problem.[1]

HEART DISEASE OCCURRING MOST FREQUENTLY IN CHILDREN

Congenital Heart Disease

A few children are born with defective hearts. Many of these defects are trivial while some impose sharp restrictions on children's activities.

Rheumatic Fever and Rheumatic Heart Disease

The teacher is much more often concerned with rheumatic fever and rheumatic heart disease, responsible for about two-thirds of all heart diseases in children. Rheumatic fever is an acute disease that often runs a chronic course and attacks the tissues in widespread areas of the body. Its overwhelming importance stems from the fact that the heart is frequently affected; it sometimes leaves the heart permanently scarred and less efficient. When this happens. the child has chronic rheumatic heart disease. Many physi-

[1] Committee on Teacher Education, Frank J. Stafford, Chairman, REPORT OF THE NATIONAL CONFERENCE ON CARDIOVASCULAR DISEASES (American Heart Association, 1950) COMMITTEE ON CARDIAC AND RHEUMATIC CHILDREN, Dr. A. R. Berger, Chairman, Curriculum Bulletin Project, New York City Board of Education, 1951.

* This article, prepared by the American Heart Association, is available from them in pamphlet form.

cians prefer to speak of the "rheumatic" child rather than of the "cardiac" child.

Even though no one knows the direct cause of rheumatic fever, it is generally agreed that certain types of infection (Group A hemolytic streptococcal) act as a "time bomb" that sets off the rheumatic infection in a susceptible individual.

"Strep" throat and scarlet fever are two "strep" infections of the kind that may be followed by rheumatic fever.

Because it has a way of sneaking up on a child, rheumatic fever is often described as an insidious disease. Here is an illustration of the three main phases in the evolution of rheumatic fever as it might affect a youngster in your classroom.

First Johnny has a "cold." This particular "cold" happens to be a strep infection.

The next period, averaging two or three weeks, is "silent" —no outward signs; Johnny *seems* to have recovered.

The third phase—that of acute rheumatic fever—may last weeks or months. Johnny should *not* be in school.

But if no one discovers what is wrong with Johnny he may be sitting in your class during this acute phase—looking a bit under par, perhaps complaining of pains in his joints, restless or tired, not his usual self.

MANAGEMENT OF RHEUMATIC FEVER—ACUTE PHASE

Although symptoms may be relieved, there is no specific cure for rheumatic fever. Of great importance is bed rest until, after weeks or months, the inflammation dies down. As in all acute infections, bed rest is prescribed; in rheumatic fever it is desirable to give the heart as much rest as possible. Salycilates such as aspirin are usually given to make the patient more comfortable if he complains of joint pains.

Experiments under way on the use of hormone substances like ACTH and Cortisone in the treatment of rheumatic

fever offer hope of shortening the period of the disease. It is too early to draw definite conclusions.

MANAGEMENT OF RHEUMATIC FEVER—INACTIVE PHASE

When the active phase of rheumatic fever is over, the child *may* be left with some scarring of the valves or other tissues of the heart.

Does this mean that every child with rheumatic fever winds up with permanent rheumatic heart disease? No. One-third of the children with rheumatic fever recover completely, without demonstrable heart damage. Another third may show some signs of cardiac damage, but they are not prevented from leading normal or almost normal lives. And only one-third of children who have one or more rheumatic infections develop heart disease severe enough that special long term planning is required. As a rule, these children require home teaching.

Management during the inactive phase will vary according to the severity and duration of the acute attack, *When the physician prescribes normal activity for a child, it is as important to see that his instructions are carried out as when he prescribes limited activity.*

PREVENTION OF RHEUMATIC FEVER

The prime concern in the treatment of a child who has had rheumatic fever is the prevention of a second attack. Rheumatic fever has a nasty tendency to strike again and again. And each new attack increases the danger of permanent injury to the heart.

Recent experience with chemotherapeutic and antibiotic agents has shown that if the "strep" infections associated with rheumatic fever can be prevented, rheumatic fever is less likely to occur.

PREVENTION OF BACTERIAL ENDOCARDITIS

Rheumatic children (and also those with congenital heart disease) are particularly subject to a bacterial infection at

the site of earlier heart damage. Administering penicillin before and after tonsillectomies or oral surgery, or—where there is severe infections of the gums—before having teeth cleaned and filled will prevent or minimize the hazards of this condition.

OTHER ASPECTS

Initial attacks of rheumatic fever occur most frequently among children in kindergarten and in the first five grades of school. But older children and adults are not spared.

Rheumatic fever is not contagious. When the phyisician recommends that a rheumatic child have a bed—preferably a bedroom—to himself, the purpose is *not* to protect the other children from rheumatic fever—which is not catching—but to protect the rheumatic child from "colds" (strep infection)the other children may bring. While not every "cold" is a "strep" infection, it is best to play safe.

Rheumatic fever tends to run in families. This fact should put teachers and parents on guard.

There is no simple test for diagnosing rheumatic fever in its earliest stages. That is why teacher observation and prompt referral of the under-par child is important.

WHAT THE TEACHER CAN DO ABOUT HEART DISEASE

In the light of the facts—what can the classroom teacher *do* about the rheumatic or cardiac child? Children with heart disease will be served best in schools with effective health programs.

Detection of Rheumatic Fever

No teacher—no one but a physician—can diagnose rheumatic fever. But the teacher has a unique opportunity to help in rheumatic fever control through early detection of danger signals and prompt referral to the school health service.

The following is not a list of specific symptoms for rheumatic fever; but you can be pretty sure that there is some-

thing wrong with any child who shows these symptoms. And it may be rheumatic fever.

Watch for: failure to gain weight; pallor; poor appetite; fatigue; frequent colds and sore throats; unexplained nosebleeds; pain in arms, legs and joints, unusual restlessness, irritability, twitching or jerky motions; behavior and personality changes; decreasing accomplishments in school by a child who has previously done well.

The informed teacher, aware of the so-called "silent" phase in the development of rheumatic fever, will be particularly observant of a child about one week to a month after he has recoved from a "cold," or from any known "strep" infection, such as scarlet fever.

Prevention of Rheumatic Fever

Preventing strep infection from spreading in the classroom may prevent some cases of rheumatic fever; the rheumatic child particularly must be protected.
The committee* urges:

"Immediately upon the recognition of a respiratory or other infection the rheumatic child should remain home and receive prompt medical attention. Furthermore, all children with respiratory infections should be kept from close contact with the rheumatic child. This may involve some measure of physical isolation of infected children in the classroom. . . . . Less stress must be placed on perfect attendance records for all children."

Since rheumatic fever has a tendency to occur in susceptible families, the teacher should be well enough informed so that she can use every opportunity to teach the basic principles of healthful living to the rheumatic child and his family. These include the need for adequate sleep and rest; a well-balanced diet; protection against chilling and getting wet; good dental care including prophylaxis before certain dental procedures; early treatment of respiratory infection; and regular medical supervision.

* Committee on Cardiac and Rheumatic Children.

Management of the Cardiac Child in the Classroom

Most cardiac children can take part in the normal activities of the regular class room. *Unless medically advised, limitations or restrictions must not be imposed.* For each child there must be a plan of action based on the recommendation of the child's physician. To make a plan that will really work takes the best thinking of teachers, doctors, nurses, the school principal, and parents, with all of them working as a team.

Before a decision is reached concerning the adaptations needed in the child's school program, the school obtains information about the child's cardiac problem and the extent of disability; it is important to consider his intellectual ability and past school accomplishments; his home and community environment; and finally the emotional and social effects of the plan.

In a few cases special adjustments may include: restricted activity during recesses and physical education periods, rest periods; a minimum of stair climbing or permitting the child to come late to class when stair climbing is unavoidable; counseling regarding diet, rest, and the need for continued medical supervision (all rheumatic children need this help); close observation for signs of substandard health; noon meal adjusted to individual needs; between-meals snacks; school-provided transportation.

A cardiac crisis in the classroom is what the teacher fears most—and is least likely to happen.

If you are ever faced with such an emergency, this is what you can do until the doctor comes. Let the child assume the most comfortable position. For fainting—hardly ever due to heart disease—the child should lie down, preferably with his head lowered. But a child who is short of breath finds it difficult to breathe while flat. Let him sit up. Loosen tight clothing and give the child plenty of air, but avoid drafts. Your own calm attitude will do much to reassure the child and the rest of the class.

PHYSCHOLOGICAL AND EMOTIONAL NEEDS

Any chronic illness, such as rheumatic fever, often creates new social and emotional problems for the child and his family.

It may accentuate a mother's need for overprotecting her child and increase the child's feelings of anxiety and dependence; and it may intensify parental rejection because of the expense and inconvenience.

The understanding teacher can help parents and child to accept realistically but without exaggeration the youngster's limitations. She can help the child feel a part of his group even when his activities are limited. Is Sally forbidden to dance? Let her be caller or operate the phonograph. Even the dances themselves can be modified so that she can take her place in the set.

A constructive, optimistic attitude on the part of the teacher is contagious. It imbues the other children with the will to understand and accept the child who is limited; and it can help create in the child a desire to participate in terms of his needs and limitations. By eliminating unreasonably competitive situations, the teacher minimizes tensions and undue fear of failure.

It is important for the child's mental health and vocational future that he keep up with his school work. When the child must remain out of school over a long period, the teacher can perform an invaluable service by advising parents how to get a home teacher.

EDUCATIONAL AND VOCATIONAL GUIDANCE

Educational guidance and vocational counseling should be started early so that the rheumatic and cardiac child can be directed to vocations that do not require heavy physical labor, working in damp or dusty places, or under other bad environmental conditions that may lead to strep infections; teaching, for example, in overcrowded classes of elementary schools carries some hazard from this point of

view. At almost every vocational level there are many jobs that can be done—and done well—by workers who have some degree of heart damage. Vocational counselors take a firm stand against drawing up lists of "jobs for cardiacs". It is a matter of matching the individual man to the specific job. The child should be encouraged to stay on in high school and get as much school as he can. This will give him a foundation for more skilled jobs.

THE ROLE OF THE AMERICAN HEART ASSOCIATION

As a voluntary agency, the American Heart Association carries on a long tradition in the health progress of the nation. Incorporated in 1924, the Association functioned as a purely scientific organization until it adopted the voluntary agency pattern in 1948. In this pattern, partnership and cooperation are fostered between the lay public and the medical profession, and with official health agencies. The Association acts as a coordinating body and as a stimulus for action by other groups and forces in the nation and the community.

The Association and its 58 affiliates throughout the United States have quite naturally taken over leadership in the heart disease program, since they enjoy the closest ties to the community. Through these voluntary organizations, comprising public-spirited private citizens, individual responsibility for the community health is exercised, in keeping with the customs of our democracy.

A national program developed by the Association supports scientific research, education of practicing physicians and other professional groups, education of the lay public, and the development of local heart associations to carry out community programs.

Scientific research is the Association's primary program objective because of the vast unexplored areas that still exist in the cardiovascular field. New knowledge is urgently

needed to make possible more effective control and prevention. The Association therefore places a premium on research "brains", giving major emphasis to the awarding of fellowships to individuals. Grants-in-aid also are extended to research projects being pursued at various institutions. Where possible, research careers are encouraged, and new research talent is developed through support of a training school for cardiovascular investigators at Western Reserve University, Cleveland.

Cooperative applied research studies also are supported since the pooling of talent and experience in these efforts permits conclusions to be arrived at in the shortest possible time. One such study is being directed by the Association's Council on Rheumatic Fever to determine the effectiveness of ACTH and cortisone in treating rheumatic fever and in preventing rheumatic heart disease, the leading fatal disease of childhood.

The latest information concerning prevention, diagnosis, treatment, care, and rehabilitation is transmitted to physicians, nurses, social workers, teachers, and other professionals. One important means of exchanging information among medical men and scientists is the Association's annual Scientific Sessions. Other media of professional education include the monthly publications, *"Circulation, the Journal of the American Heart Association,"* and *"Modern Concepts of Cardiovascular Disease."* In addition, the Association aids in the development of postgraduate courses, symposia, and scientific meetings, and makes available technical aids such as books, slides, and films. Standards are established for cardiovascular clinics, which in themselves constitute an important medium of professional education.

A major objective of the health educational program is to impress upon the public the need for supporting broadened scientific research in the cardiovascular field, and to help promote improved physical and emotional health by the elimination of fear and misunderstanding, thus reducing

waste of life and manpower. A vital part of the public educational program, and the chief means of financing the entire program effort, is the annual fund-raising campaign conducted by the Association and its affiliates during February. Publicity of all types, educational pamphlets, films, exhibits, and many other media of mass communication are used in this phase of the program. The Association also issues a quarterly publication for the lay public entitled, *"The American Heart."*

The educational program is closely interwoven with the Association's program of community service. Application of new and existing knowledge is stimulated by the Association through the organization of and guidance to affiliated associations that develop community heart programs. These programs have included the organization of classes and consultation services to lighten the work load for homemakers with heart disease; and the spurring of community action for rehabilitation and employment of heart patients. especially in the light of the current defense emergency which requires the fullest use of military and industrial manpower.

OFFICIAL HEALTH AGENCY PROGRAMS FOR HEART DISEASE CONTROL

Thomas E. O'Brien

The Federal heart program was launched in June 1948, to supplement the work of private foundations such as the Life Insurance Medical Research Fund, the Helen Hay Whitney Foundation and national voluntary organizations, such as the American Heart Association.

The National Heart Act, established the National Heart Institute as one of the eight major National Institutes of Health, with headquarters in Bethesda, Maryland.

The National Heart Act was enacted to "support research and training in diseases of the heart and circulation, and to aid the States in the development of community programs for the control of these diseases. . . " Its purpose is "to improve the health of the people of the United States through the conduct of researches, investigations, experiments, and demonstrations relating to the cause, prevention, and methods of diagnosis and treatment of diseases of the heart and circulation; assist and foster such researches and other activities by public and private agencies, and promote the coordination of all such reseaches and activities and the useful application of their results; provide training in matters relating to heart diseases, including refresher courses for physicians; and develop, and assist States and other agencies in the use of, the most effective methods of prevention, diagnosis, and treatment of heart diseases."

The National Heart Act provides for financial aid to research in non-Federal institutions and to individual scientists; for research fellowships and traineeships; aid to medical education in the teaching of cardiovascular diseases; aid to the States for control of heart diseases; and for conduct of research by the Public Health Service.

The importance of widely disseminating information on all aspects of heart disease was recognized by the Congress, which specifically provided in the National Heart Act that the Surgeon General shall "through the Institute and in cooperation with the National Advisory Heart Council, establish an information center on research, prevention, diagnosis, and treatment of heart diseases, and collect and make available, through publications and other appropriate means, information as to, and the practical application of, research and other activities."

A steadily developing program of professional and public information is being carried out by the National Heart Institute. The Heart Information Center, in cooperation with the Heart Disease Control Branch of the Division of Chronic Disease, is providing services and conducting activities to keep individual and organizations in the heart disease field informed as to current developments and the experience of others, to promote increased use of present knowledge and the effective application of research findings, and to assist early casefinding, diagnosis and treatment through professional and lay education.

Activities of the Center include the preparation and distribution of heart disease information-education articles, leaflets, pamphlets, reports, and other publications; development and production of audio-visual materials, exhibits, radio and television broadcasts and transcriptions; maintenance of an inquiry and reference service; and cooperation with other agencies and organizations in the planning and execution of informational and educational projects relating to the cardiovascular diseases.

Heart programs in the Public Health Service, other than those carried on by the National Heart Institute, are centered in two divisions of the Bureau of State Services. The Bureau's Division of State Grants allots grants-in-aid to the States for developing state and local heart disease con-

trol programs. The Bureau's Division of Chronic Disease, Heart Disease Control Branch, makes available consultative services on all phases of heart disease. It also conducts field studies and demonstrations to establish, develop, and evaluate practical methods of conducting control programs and early case-finding projects in local communities.

In carrying these programs forward, the National Heart Institute and the Bureau of State Services of the Public Health Service foster the closest working relationships with all individuals, groups, and organizations—public and private—and with state and local governments interested in this foremost health problem.

Thomas E. O'Brien, M.D. is Surgeon, U. S. Public Health Service.